

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 426 702 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
06.12.2006 Bulletin 2006/49

(51) Int Cl.:
F24F 7/02 ^(2006.01) **F24F 7/00** ^(2006.01)

(21) Application number: **02380245.7**

(22) Date of filing: **29.11.2002**

(54) Industrial ventilation apparatus

Appareil industriel de ventilation
Industrielle entlüftungsvorrichtung

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**

(43) Date of publication of application:
09.06.2004 Bulletin 2004/24

(73) Proprietor: **Batlle Collet, Joan
Cabrlis (ES)**

(72) Inventors:
• **Batlle Collet, Joan
08400 Granollers (Barcelona) (ES)**

• **Vallespin Mejias, Jaime
08400 Granollers (Barcelona) (ES)**

(74) Representative: **Esteban Perez-Serrano, Maria
Isabel
UDAPI & Asociados
Patentes y Marcas
Explanada, 8
28040 Madrid (ES)**

(56) References cited:
**EP-A- 1 215 448 DE-U- 20 109 561
US-A- 2 569 319 US-A- 2 700 331**

EP 1 426 702 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

PURPOSE OF THE INVENTION

[0001] This invention refers to an apparatus for industrial ventilation of double enclosed spaces, from among the different large enclosed space air extraction apparatus.

[0002] This invention is characterised by a special construction of the apparatus, of cylindrical base hinged to the roof and that ventilates two different enclosed spaces, for example, a building and its false roof, by means of double channelling of the air, whether the extraction is controlled or not by remote control, whether forced or natural, or a mixture of both procedures.

BACKGROUND OF THE INVENTION

[0003] Ventilation systems of the Venturi type, those of simple air convection and, more recently, the spherical base spiral system type, are well-known.

[0004] However, all these ventilation systems are similar in that they carry out the extraction of air from a single enclosed space, whether that of the false ceiling, or that of the building located immediately below, in the first case directly, in the second, through a duct that passes through that enclosed space

[0005] Also it is well-known that, given the widely variable incline of roofs, the bases of the ventilation apparatus, natural or forced, practically always have to be manually adapted, by connecting various pieces, of very different configuration, parallel funnelled, conical or spherical, and also joined to each other by rivets, spot welds, twin drilled holes with means of fixing, and a wide etcetera of conventional finishes that engender problems of waterproofing of the duct.

[0006] The applicant is unaware of the existence of ventilation systems for two enclosed spaces that resolve the previously described difficulties, with the simplicity and efficiency of the invention herein described.

[0007] It is known from the State of the Art the ventilation apparatus as the one disclosed in US 2569319 which is main aim is to obtain an apparatus wherein the fan and motor are not in the same conduit of evacuation, avoiding the accumulation of moisture, grease or other inflammable matter on the fan or motor. On the other hand the industrial ventilation apparatus of the present invention seeks to obtain an apparatus specially designed for industrial ventilation wherein is sought to obtain ventilation for double or more enclosed spaces using natural or forced ventilation, being made through a common roof.

DESCRIPTION OF THE INVENTION

[0008] This invention refers to an apparatus for industrial ventilation of double enclosed spaces, from among the different large enclosed space air extraction apparatus,

both those that have natural direct ventilation and those with forced ventilation with air ducts.

[0009] This invention is characterised by a special construction of the apparatus, that carries out the ventilation of two separate enclosed spaces through the common roof, for example, in the case of a building and of its false ceiling, by means of a double extraction of air, whether this extraction is carried out in a controlled or in a natural manner, remote control preferably being used for this purpose in both cases. Besides this forced or natural ventilation, mixed ventilation with both procedures is possible.

[0010] In a first alternative of the forced type, this invention is characterised by a flue with a convex curved base, whether this be of spherical, cylindrical or ovoid sector; with barrel leading to a ring-shaped circular crown, fabricated in position at the intake of the apparatus, so that the ventilation of the under-roof area is carried out by the ring area and that of the lower enclosed space is carried out by the axial area, both areas sized for passing air according to the volume of each enclosed space to be ventilated and always with a single apparatus and very low pressure drops, the innermost duct also having a gate valve, closed in winter to avoid heat losses with which, this mixed ventilation becomes natural in this period, when the air extractor stops, the duct butterfly of the lower enclosed space closing and only the air coming from the under-roof enclosed space or chamber circulating, with which its humidity is extracted naturally.

[0011] Another alternative, that complements this invention, is that of having various air intakes at different levels of the lower enclosed space, in industrial premises that require a more precise extraction of air by layers; for example, with the purpose of breaking-up stratification, with which a number of intakes, at different heights, can be had.

[0012] Everything outlined is equally valid for driving air within the enclosed space(s); and the most efficient and rapid way of extracting or of driving air from or to the enclosed space(s), without problems of joints and/or of separators, although not the only one, is that of connecting consecutive ends of the ducts at their respective bases, for example, radially with metal sheet.

[0013] On the other hand, the apparatus intake can have a different construction, being formed on a cylindrical section base with rectangle flanges, that have the air evacuation connection along all the generatrices of this sector, with an angle of its axis with respect to the radial plane of the cylinder identical to that of the incline of the roof.

[0014] The wings can also be the projecting section of a metal base sheet adequately holed, for passing the vent funnel. In this way, both the mounting hole or holing of the metal sheet like that of the cylindrical sector can be of any angle, to be carried out in situ by the installers, according to requirements.

[0015] The flue is finished off with an upper cover, preferably of spherical sector, and the combination of the

forced air shaft along with the space within the base spherical sector, the end cylindrical section of the funnel and the convexity of the cover, allow it to be positioned at a height not greater than half of the diameter of this funnel, with which the centre of gravity, unavoidably raised by the required upper end location of the fan, is lowered considerably, and the flue better withstands the pressure of the wind.

[0016] Finally, natural ventilation extends to both enclosed spaces and can be made controllable, simply by eliminating the butterfly of the axial duct, while the motor fan can be substituted by a motor, adjoining the centre of the cover and fitted with an extended axis, and that incorporates a twin spiral screw so that the cover can be located in a large number of different heights, between its maximum extension and its contact with the upper end of the barrel of the funnel, that is, the possibility of millimetric adjustment exists from the closed position to the complete opening of the cover, a manual remote control or a regulating control connected to an anemometer, sufficing for this purpose.

DESCRIPTION OF THE DRAWINGS

[0017] This descriptive statement, is complemented by a set of drawings, illustrative and never limitative of the preferred example of the invention.

[0018] Figure 1 is the variant with a flue of spherical sector base and/or fixed radial extension of the funnel.

[0019] Figure 2 is a schematic and partial representation of the previous figure, that shows the construction of the internal air shaft for both enclosed spaces, with two air intakes at a different level in the lower one of them, likewise one of the drawings showing the layout in the case of horizontal air evacuation.

[0020] Figure 3 is the variant of flue with cylindrical sector base and adjustable radial extension of the funnel, depending on the equivalent angle of the roof.

[0021] Figure 4 is the controllable forced ventilation variant, without the butterfly and in which the fan is substituted by a motorized raising and closing of the cover.

PREFERABLE EMBODIMENT OF THE INVENTION

[0022] In view of what has been previously set out, the present invention refers to an industrial ventilation apparatus for double enclosed spaces, from among the different air extraction apparatus using natural or forced ventilation; essentially characterised by carrying out the ventilation of the height-separated enclosed spaces, through the common roof, whether with forced and controlled extraction, natural or mixed, based on a spherical or ovoid cylindrical sector base flue (1), whether with rectangular flanges (1.1) or with a projecting section of a large holed metal sheet (1.2), to admit a section of the vent funnel or barrel (2) radially positioned with a ring-shaped circular crown, constructed in position at the intake of the apparatus, so that the ventilation of the en-

closed space (3) immediately below the roof (4) is carried out by the ring-shaped duct (2.2) and that of the enclosed space (5) below the false ceiling (6) is carried out by the axial duct (2.1) of the barrel (2), both air passage openings being sized according to the volume of each enclosed space (3) and (5) to be ventilated, with a single apparatus and minimum pressure losses, likewise the axial duct (2.1) having a motorized (2.4) butterfly valve (2.3).

[0023] Complementarily at least two air intakes (2.2.1) and (2.2.2) are set up, connecting the consecutive ends of these ducts at their respective bases, with radial rods, these reaching the same different levels (5.1) and (5.2) of the enclosed space (5) below, that break up its stratification.

[0024] Alternatively to the radially positioned barrel construction (2), the air evacuation opening (1.3) is placed along the generatrices of this sector, with an angle of its axis with respect to the radial plane of the cylinder identical to that of the roof (4), of whatever incline, whether to be previously measured and the opening made in a workshop or whether to be carried out in situ by the installers, according to requirements.

[0025] The flue is finished off with an upper cover (7) preferably of spherical sector, and that may or may not incorporate a plate (7.1) internal to this cover, of discoid configuration, whether truncated-conical or whether corrugated curved, that minimizes air blowback in the cover and that is held at the perimeter by anti-vibration rubber (7.2) in a horizontal "U".

[0026] Alternatively to all the above-mentioned the extraction can drive air into one or both of the two enclosed spaces (3) and (5), in this latter case simultaneously into, at least, the levels (5.1) and (5.2).

[0027] A different variant is the one that allows natural ventilation to be extended to both enclosed spaces (3) and (5) and to convert this in controllable, by eliminating the butterfly (2.3) of the axial duct (2.1) and substitution of the extractor (8) motor (8.1), by another motor (9) adjacent to the centre of the cover and designed with an extended axis (9.1) and that incorporates a twin spiral screw (9.2) for multiple positioning of the cover opening (7) or with the closing of this latter directed by a manual remote control or regulation by means of an electronic circuit connected to an anemometer, not shown in the figure.

[0028] The electrical supply (9.3) to the motor (9) is carried out through the interior part of the cover (7), by means of a channelling (7.3) and between this and any bracket of the cover (7) its rotation is prevented, leaving the vertical displacement of the cover (7) between the extreme positions of the twin spiral screw (9.2) as the only possible movement.

[0029] The layout of the air outlet or of its intake can also be horizontally set up, direction, by simple access holing of the opposing part of the construction, main wall and also partitioning of the air chamber. With which the evacuation of the direct heat accumulated in this cham-

ber in the facades oriented South, and everything previously said being valid, except for the change of positioning of the apparatus, is achieved.

Claims

1. Industrial ventilation apparatus for double enclosed spaces, from among the different air extraction apparatus using forced or direct natural ventilation, comprising a flue (1), an axial duct (2.1), an extractor (8) actuated by a motor (8.1), for carrying out the ventilation, with a single apparatus and minimum pressure losses, the two enclosed spaces being separated in height, through a common roof, whether With forced and controlled extraction, naturally, or mixed, wherein the flue (1) is of cylindrical, spherical or ovoid sector base, with rectangular flanges (1.1) to admit a section of the vent funnel or barrel (2) radially positioned with ring-shaped circular crown, which is fabricated in position at the apparatus intake, so that the ventilation of the enclosed space (3) located immediately below the roof (4) is carried out by a ring-shaped duct (2.2) and that of the enclosed space (5) below the false ceiling (6) is carried out by the axial duct (2.1) of the barrel (2), both air passage openings being sized according to the volume of each enclosed space (3) and (5) to be ventilated, likewise the axial duct (2.1) having a motorized (2.4) butterfly valve (2.3).
2. Industrial ventilation apparatus for double enclosed spaces, according to claim 1, **characterised by** having at least two complementary air intakes (2.2.1) and (2.2.2), the consecutive ends of these ducts connected by radial rods at their respective bases; these ducts reaching different levels (5.1) and (5.2) of the interior of the lower space (5), that break up its stratification.
3. Industrial ventilation apparatus for double enclosed spaces, according to claim 1, **characterised in that** as an alternative to the construction of the radially positioned barrel (2), the air evacuation perforation (1.3) is placed along the generatrices of this sector, with an angle of its axis with respect to the radial plane of the cylinder identical to that of the roof (4), of whatever incline.
4. Industrial ventilation apparatus for double enclosed spaces, according to claim 2 **characterised in that**, alternatively to extracting air from the interior of both enclosed spaces (3) and (5) air can be driven into the interior of one or both enclosed spaces (3) and (5), in this latter case simultaneously into, at least, the levels (5.1) and (5.2).
5. Industrial ventilation apparatus for double enclosed

spaces, according to claim 3 ó 4, **characterized in that** the layout of the air outlet or its intake is carried out in horizontal direction, by simple access holing of the opposing part of the construction, main wall and also partitioning of the air chamber.

6. Industrial ventilation apparatus for double enclosed spaces, according to claim 1, **characterized in that** the flue finishing off with an upper cover (7), of spherical sector, and incorporate a plate (7.1) internal to this cover, of discoid configuration, whether truncated-conical or whether corrugated curved, with the aim of minimising the blowback of air in the cover, and that is held at the perimeter by anti-vibration rubber (7.2) in a horizontal "U".
7. Industrial ventilation apparatus for double enclosed spaces, comprising a flue (1), an axial duct (2.1), for carrying out the ventilation with a single apparatus and minimum pressures losses, the double enclosed spaces being separated in height, through a common roof, whether with forced and controlled extraction, naturally or mixed, wherein the flue (1) admits a section of a vent funnel or barrel (2) so that the ventilation of the enclosed space (3) located immediately below the roof (4) is carried out by a ring-shaped duct (2.2) and that of the enclosed space (5) below the false ceiling (6) is carried out by the axial duct (2.1) of the barrel (2); it also comprises a motor (9) adjacent to the centre of the cover and provided with an extended axis (9.1) and that incorporates a multiple position twin spiral screw (9.2) whether with a cover (7) opened or closed, directed by a manual remote control, or regulation using an electronic circuit connected to an anemometer.
8. Industrial ventilation apparatus for double enclosed spaces, according to claims 1 and 4, **characterized in that** the electrical supply (9.3) to the motor (9) is carried out through the interior area of the cover (7), through a channelling (7.3) and between this and any bracket of the cover (7) the rotation of the latter is avoided, forcing the vertical displacement of the cover (7) between the end positions of the twin spiral screw (9.2).

Patentansprüche

1. Industrielles Lüftungsgerät für doppelt umschlossene Räume von den verschiedenen Abluftgeräten, die mittels Umluft oder natürlicher direkter Belüftung lüften, das einen Belüftungsschacht (1), eine axiale Leitung (2.1), einen von einem Motor (8.1) betriebenen Extraktor (8) umfasst, , zum Lüften mit einem einzigen Gerät und minimalem Druckverlust, für zwei abgeschlossene Räume, die in der Höhe getrennt sind, durch ein gemeinsames Dach, sei es durch erzwun-

- gene oder kontrollierte Absaugung, natürlich oder gemischt, wobei der Belüftungsschacht (1), der eine zylindrische, sphärische oder eiförmige Basis aufweist mit rechteckigen Flanschen (1.1) versehen ist, um einen Abschnitt des Lüftungsschachts oder Laufs (2) aufzunehmen, der radial positioniert mit einer ringförmigen runden Krone, die in einer Position so an dem Geräteeinlass hergestellt ist, dass die Belüftung des umschlossenen Raums (3), der sich unmittelbar unter dem Dach (4) befindet, durch eine ringförmige Leitung (2.2) vollzogen wird und die des umschlossenen Raums (5) unter der abgehängten Decke (6) durch eine axiale Leitung (2.1) des Laufs (2) durchgeführt wird, wobei beide Luftzufuhröffnungen gemäss dem Volumen jedes umschlossenen zu belüftenden Raums (3) und (5) ausgelegt sind und ausserdem die axiale Leitung (2.1) ein motorisiertes (2.4) Drosselventil (2.3) aufweist oder als einen hervorspringenden Abschnitt (1.2) eines langen perforierten Metallabschnitts (1.2),,
2. Industrielles Lüftungsgerät für doppelt umschlossene Räume gemäss Anspruch 1, **dadurch gekennzeichnet, dass** es mindestens zwei zusätzliche Lufteinlässe (2.2.1) und (2.2.2) aufweist, wobei die aufeinanderfolgenden Enden dieser Leitungen durch radiale Stangen an der jeweiligen Basis miteinander verbunden sind; diese Leitungen erreichen verschiedene Niveaus (5.1) und (5.2) des Inneren des unteren Raums (5), die deren Schichtung aufbricht.
3. Industrielles Lüftungsgerät für doppelt umschlossene Räume gemäss Anspruch 1, **dadurch gekennzeichnet, dass** als eine Alternative zu der Konstruktion des radial positionierten Laufs (2) die Öffnung zum Luftablassen (1.3) entlang der Generatoren dieses Bereichs angebracht ist, mit einem Winkel ihrer Achse hinsichtlich der Radialebene des Zylinders, der identisch mit dem des Dachs (4) ist, unabhängig von dessen Neigung.
4. Industrielles Lüftungsgerät für doppelt umschlossene Räume gemäss Anspruch 2, **dadurch gekennzeichnet, dass** als eine Alternative zu dem Absaugen von Luft aus dem Inneren der beiden umschlossenen Räume (3) und (5) die Luft ins Innere von einem oder beiden umschlossenen Räumen (3) und (5) geleitet werden kann und in diesem letzten Fall gleichzeitig mindestens in die Niveaus (5.1) und (5.2).
5. Industrielles Lüftungsgerät für doppelt umschlossene Räume gemäss dem Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** die Auslegung des Luftaustlasses oder des Lufteinlasses in waagerechter Richtung durchgeführt wird, durch das einfache Aushöhlen des gegenüberliegenden Teils der Konstruktion, Hauptwand und Aufteilung der Luftkammer.
6. Industrielles Lüftungsgerät für doppelt umschlossene Räume gemäss Anspruch 1, **dadurch gekennzeichnet, dass** der Belüftungsschacht mit einer oberen Abdeckung (7) endet, die vorzugsweise einen sphärischen Querschnitt hat und eine Platte (7.1) im Inneren dieses Deckels umfassen kann, die diskoidal angelegt ist, sei sie stumpf-kegelig oder gewellt gebogen, mit dem Ziel, das Rückblasen der Luft in die Abdeckung zu minimieren, und die umfänglich von einem Antivibrationsgummi (7.2) in einem waagerechten "U" gehalten wird.
7. Industrielles Lüftungsgerät für doppelt umschlossene Räume, das einen Belüftungsschacht (1), eine axiale Leitung (2.1), einen von einem Motor (8.1) betriebenen Extraktor (8) umfasst, zum Lüften mit einem einzigen Gerät und minimalem Druckverlust, wobei die doppelt umschlossenen Räume in der Höhe getrennt sind, durch ein gemeinsames Dach, sei es durch erzwungene oder kontrollierte Absaugung, natürlich oder gemischt, wobei der Belüftungsschacht (1), einen Abschnitt des Lüftungsschachts oder Laufs (2) aufnimmt, so dass die Belüftung des umschlossenen Raums (3), der sich unmittelbar unter dem Dach (4) befindet, durch eine ringförmige Leitung (2.2) vollzogen wird und die des umschlossenen Raums (5) unter der abgehängten Decke (6) durch eine axiale Leitung (2.1) des Laufs (2) durchgeführt wird; es umfasst auch einen Motor (9), der an die Mitte der Abdeckung angrenzt und über eine verlängerte Achse (9.1) verfügt und eine Multiposition-Doppelspindelschraube (9.2) umfasst, sei es bei geöffneter oder geschlossener Abdeckung (7), mit manueller Fernbedienung oder Regulierung mittels eines elektronischen Stromkreises, der an ein Anemometer angeschlossen ist.
8. Industrielles Lüftungsgerät für doppelt umschlossene Räume gemäss den Ansprüchen 1 und 5, **dadurch gekennzeichnet, dass** die elektrische Versorgung (9.3) des Motors (9) durch den inneren Bereich der Abdeckung (7) mittels einer Furche (7.3) durchgeführt wird und zwischen dieser und jedweder Klammer der Abdeckung (7) die Rotation dieser verhindert wird, wobei die vertikale Verschiebung der Abdeckung (7) zwischen den Endpositionen der Doppelspindelschraube (9.2) verhindert wird.

Revendications

1. Appareil industriel de ventilation pour des espaces fermés doubles, du type des différents appareils d'extraction d'air qui utilisent de la ventilation naturelle forcée ou directe, carneau (1), un conduit axiale (2.1), un extracteur (8) commandé par un moteur

- (8.1) pour la mise en oeuvre de la ventilation, avec un seul appareil et des pertes de pression minimales, les deux espaces fermés étant séparés en hauteur, à travers un toit commun, soit avec de l'extraction forcée et contrôlée, naturellement, ou mélangée, dans lequel le carneau (1) est de base à secteur cylindrique, sphérique ou ovoïde, avec des rebords rectangulaires (1.1) pour admettre une section du trou ou canon de ventilation (2) positionné radialement avec une couronne circulaire annulaire, qui se fabrique sur place à l'entrée d'aspiration de l'appareil, de manière que la ventilation de l'espace fermé (3) situé immédiatement en dessous du toit (4) est réalisée par la conduite annulaire (2.2) et celle de l'espace fermé (5) en dessous du faux plafond (6) est réalisée par la conduite axiale (2.1) du canon (2), les deux ouvertures de passage de l'air étant dimensionnées selon le volume de chaque espace fermé (3) et (5) à ventiler, la conduite axiale (2.1) ayant également un clapet à papillon (2.3) motorisé (2.4).
2. Appareil industriel de ventilation pour des espaces fermés doubles selon la revendication 1, **caractérisé en ce qu'il** a au moins deux admissions d'air complémentaires (2.2.1) et (2.2.2), les extrémités consécutives de ces conduites étant connectées par des tringles radiales à leurs bases respectives ; ces conduites atteignant différents niveaux (5.1) et (5.2) de l'intérieur de l'espace inférieur (5), qui divisent sa stratification.
3. Appareil industriel de ventilation pour des espaces fermés doubles, selon la revendication 1, **caractérisé en ce que** comme alternative à la construction du canon radialement positionné (2), la perforation d'évacuation d'air (1.3) est placée le long des génératrices de ce secteur, son axe formant un angle par rapport au plan radial du cylindre identique à celui du toit (4), ou une inclinaison quelconque.
4. Appareil industriel de ventilation pour des espaces fermés doubles, selon la revendication 2, **caractérisé en ce que**, alternativement pour extraire de l'air de l'intérieur des deux espaces fermés (3) et (5), l'air peut être entraîné à l'intérieur de l'un ou des deux espaces fermés (3) et (5), dans ce dernier cas simultanément à l'intérieur, au moins, des niveaux (5.1) et (5.2).
5. Appareil industriel de ventilation pour des espaces fermés doubles, selon les revendications 3 ou 4, **caractérisé en ce que** la disposition de l'entrée d'air ou son admission es mise en oeuvre dans la direction horizontale, par un seule perforation d'accès de la partie opposée de la paroi principale de construction et également le cloisonnement de la chambre à air.
6. Appareil industriel de ventilation pour des espaces fermés doubles, selon la revendication 1, **caractérisé en ce que** le carneau étant coiffé d'un couvercle supérieur (7), de secteur sphérique, et incorpore une plaque (7.1) interne à ce couvercle, de configuration discoïde, soit tronc-conique soit courbée, ondulée avec l'objectif de minimiser le contre-soufflage de l'air dans le couvercle, et qui est maintenu dans le périmètre par du caoutchouc antivibratoire (7.2) dans un « U » horizontal.
7. Appareil industriel de ventilation pour des espaces fermés doubles, comprenant un carneau (1), une conduite axiale (2.1) pour la mise en oeuvre de la ventilation avec un seul appareil et des pertes de pression minimales, les espaces fermés doubles étant séparés en hauteur, à travers un toit commun, soit avec de l'extraction forcée ou contrôlée naturellement ou mélangée, dans lequel un carneau (1) admet une section d'un trou ou canon de ventilation (2) de manière que la ventilation de l'espace fermé (3) situé immédiatement en dessous du toit (4) soit mise en oeuvre par une conduite annulaire (2.2) et que l'espace fermé (5) en dessous du faux toit (6) est réalisé par la conduite axiale (2.1) du canon (2) ; il comprend également un moteur (9) attenant au centre du couvercle et pourvu d'un axe étendu (9.1) et qui incorpore deux vis hélicoïdales à position multiple (9.2), soit avec un couvercle (7) ouvert ou fermé, dirigées par une télécommande ou régulation manuelle en utilisant un circuit électronique connecté à un anémomètre.
8. Appareil industriel de ventilation pour des espaces fermés doubles, selon les revendications 1 à 4, **caractérisé en ce que** l'alimentation électrique (9.3) du moteur (9) est réalisée à travers la zone intérieure du couvercle (7), à travers une canalisation (7.3) et entre celle-ci et tout support du couvercle (7), la rotation de ce dernier est évitée, en forçant le déplacement vertical du couvercle (7) entre les positions d'extrême des deux vis hélicoïdales (9.2).

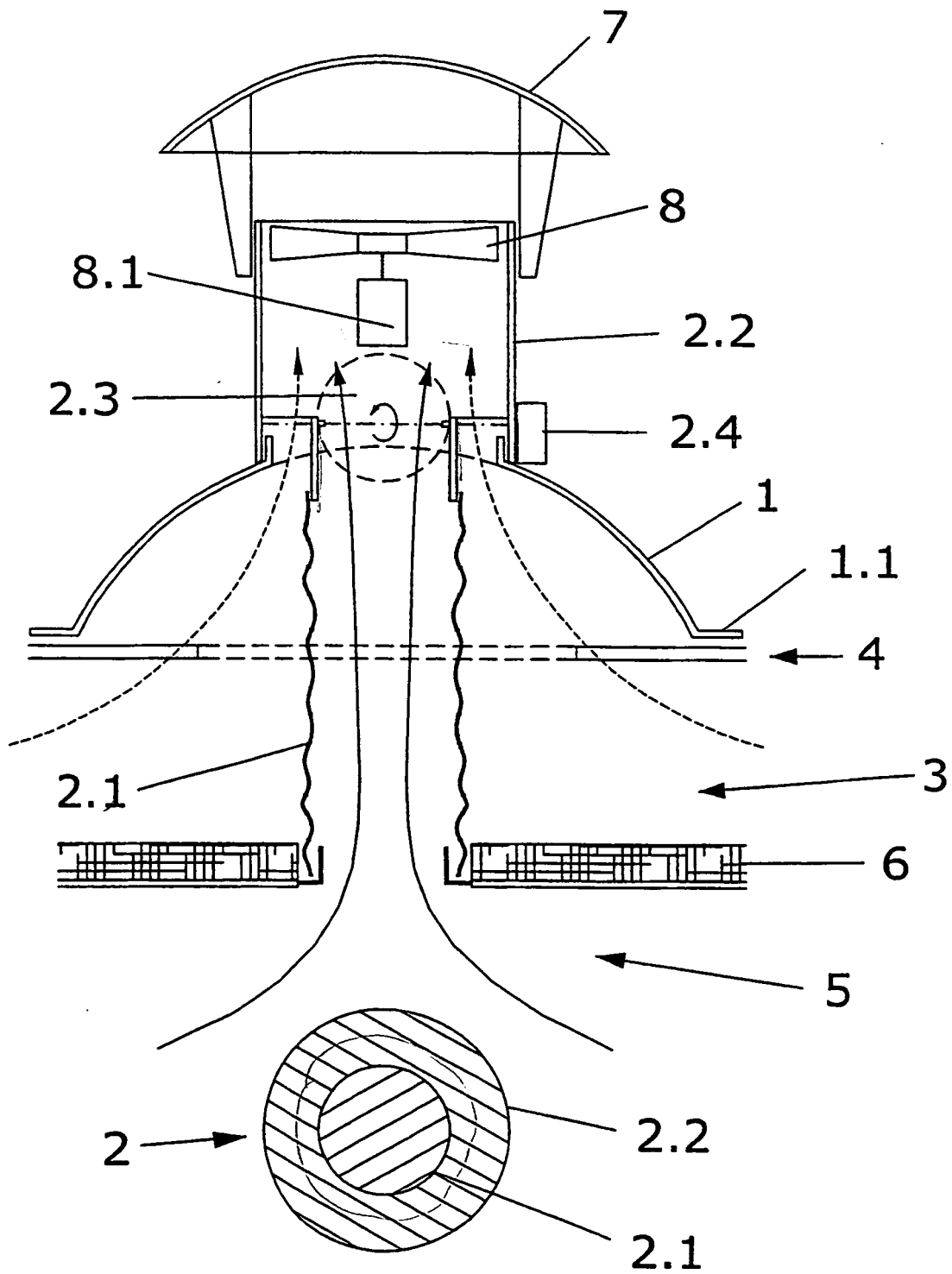


FIG.1

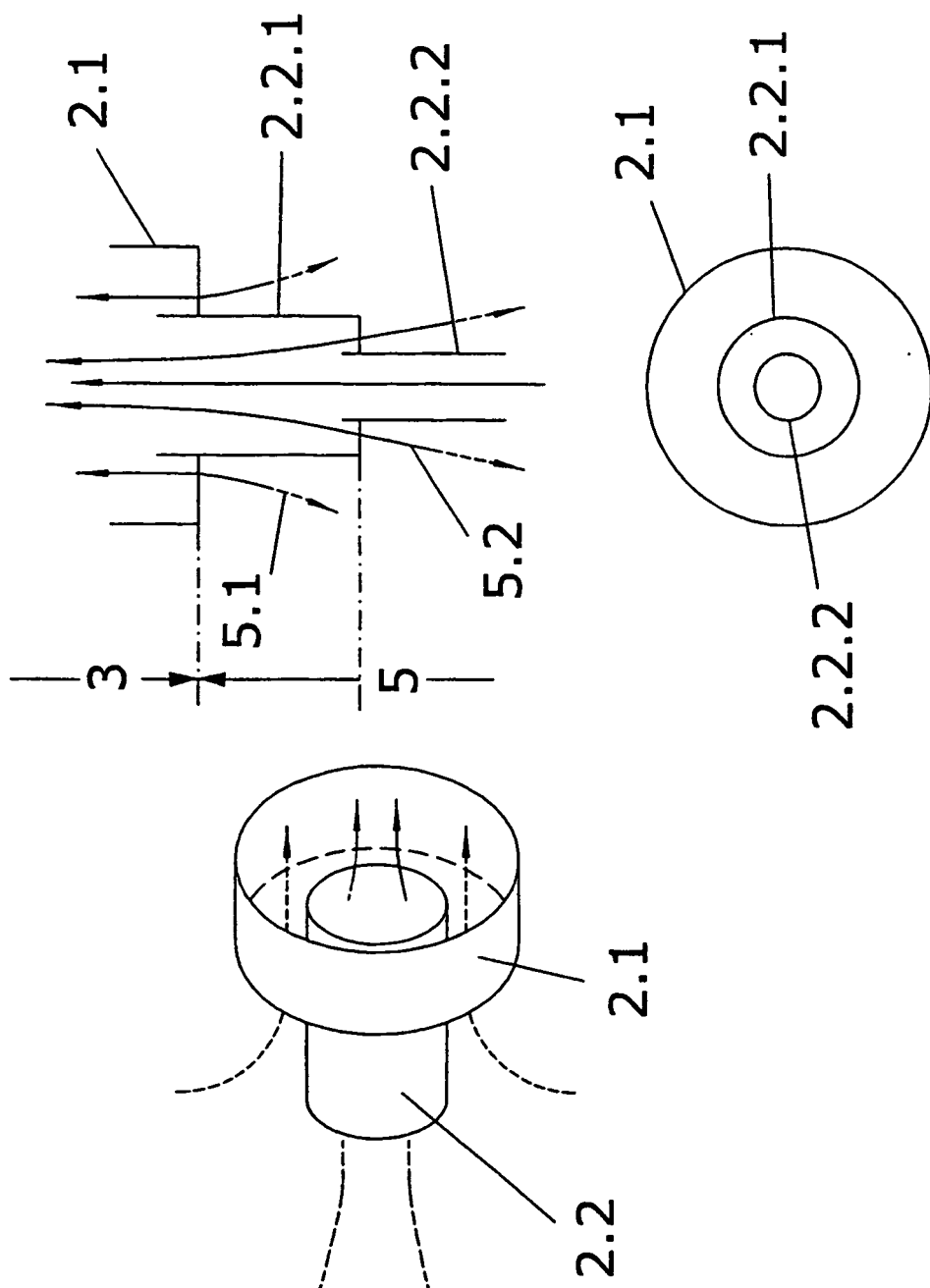


FIG.2

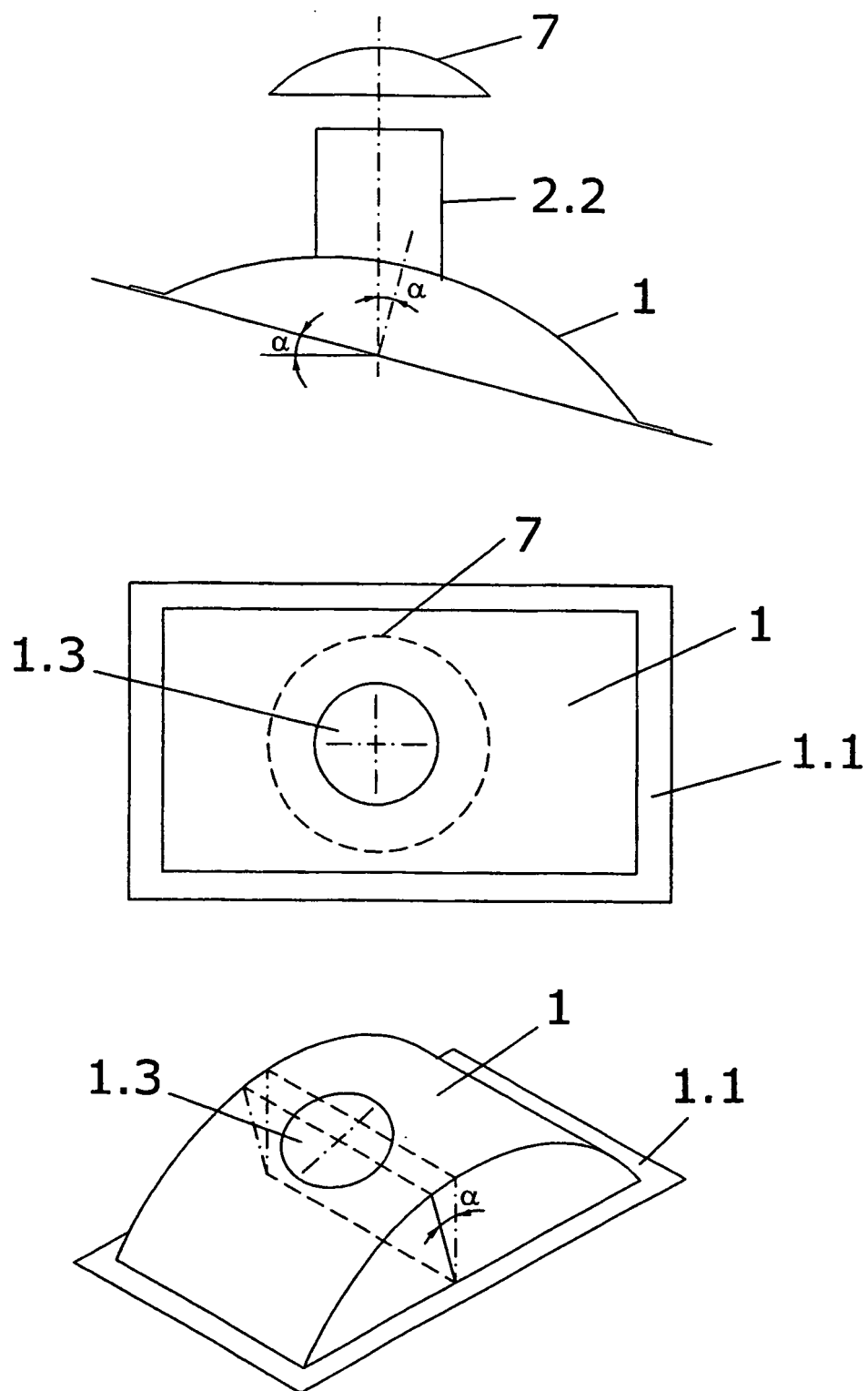


FIG.3

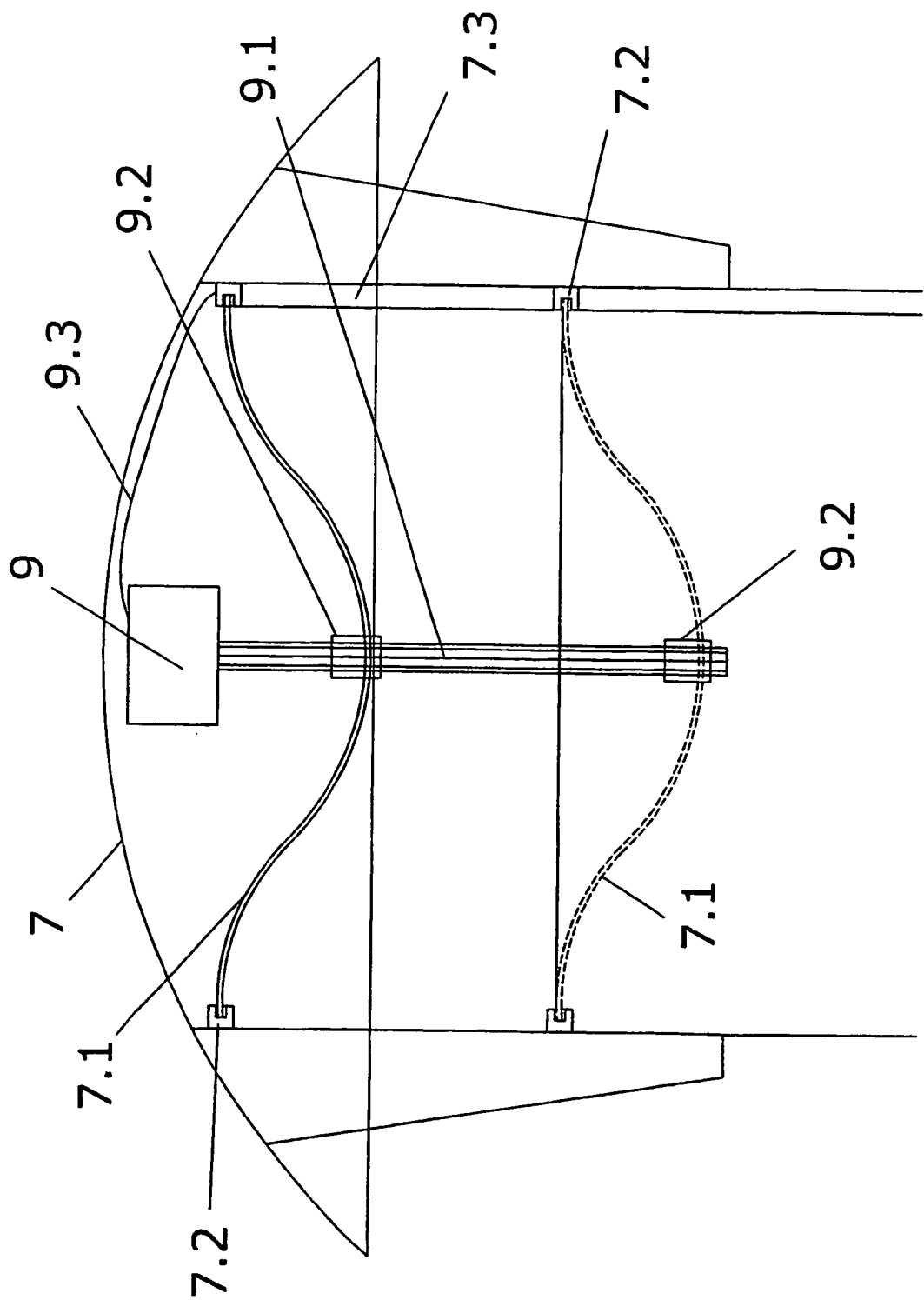


FIG.4